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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Bernd Hirthe

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EXAMINER

SHEH, ANTHONY H

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/580,124	Applicant(s) HIRTHE ET AL.	
	Examiner ANTHONY H. SHEH	Art Unit 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 16-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 16-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 25 February 2010 has been entered.
2. Claims 16-18 are currently amended. Claims 31-40 are newly filed. Claims 16-40 are pending. The amendment to claim 16 further defines "high IR absorption" and is supported by the original disclosure (see pages 2-4 of the instant specification). Claims 17 and 18 were amended to correct minor informalities. Claims 31-40 closely parallel claims 16-24, but remove $\text{Cu}_2\text{PO}_4\text{OH}$ as a possible inorganic metal phosphate. No new matter has been entered into the claims.

Claim Objections

3. Claims 20 and 31 are objected to. The compound $\text{Cu}_3(\text{PO}_4)(\text{OH})_3$ is repeated twice in the Markush group.
4. Claim 35 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. The claim recites the same Markush group as parent claim 31. Therefore, the dependent claim does not further its parent since they have identical scope.

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Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 31 and 34 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. See MPEP § 2173.05(c). Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949). The cited claims recite a broad genus of chemical compounds having formula $\text{Mex}(\text{PO}_4)_y(\text{OH})_z$, and then proceed to recite a Markush group which defines desired species; the Markush group has substantially narrower scope than the genus which creates confusion in the claims.

Claim Rejections - 35 USC § 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claim 16-22 are rejected under 35 U.S.C. 102(b) as being anticipated by FABER et al., US 5,489,639 (hereafter '639), as evidenced by *Sigma-Aldrich Product Description 344400: Copper(II) hydroxide phosphate* and *GE Plastics Product Description: VALOX® 325C*.

10. The discussion of '639 in paragraphs 6-9 of the previous Office action mailed 30 November 2009 is incorporated herein by reference. Briefly, '639 discloses the use of cupric hydroxide phosphate, having chemical formula $\text{Cu}_2\text{PO}_4\text{OH}$ (see *Sigma-Aldrich Product Description 344400: Copper(II) hydroxide phosphate*), in an additive in a variety of thermoplastic resins, including polybutylene terephthalate (see *GE Plastics Product Description: VALOX® 325C*). The foregoing compound satisfies the inorganic metal phosphate of claims 16-22. '639 does not discuss the infrared absorption of the resulting thermoplastic material, though the additive does allow for laser-marking.

11. However, the claimed IR absorption behavior cannot be divorced from its chemical composition; the optical behavior of the claimed composition results from the components from which it is derived. In this case, Applicant has recognized an additional property of the '639 composition. "[T]he discovery of a previously unappreciated property of a prior art composition, or of a scientific explanation for the prior art's functioning, does not render the old composition patentably new to the discoverer." *Atlas Powder Co. v. Ireco Inc.*, 190 F.3d 1342, 1347, 51 USPQ2d 1943, 1947 (Fed. Cir. 1999). Thus the claiming of a new use, new function or unknown property which is inherently present in the prior art does not necessarily make the claim patentable. *In re Best*, 562 F.2d 1252, 1254, 195 USPQ 430, 433 (CCPA 1977).

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Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. The U.S. Supreme Court supplied seven rationales in *KSR International v. Teleflex Inc.*, 550 USPQ2d 1385, that, by following the factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), establish a *prima facie* case of obviousness:

- (a) Combining prior art elements according to known methods to yield predictable results;
- (b) Simple substitution of one known element for another to obtain predictable results;
- (c) Use of a known technique to improve similar devices, methods, or products in the same way;
- (d) Applying a known technique to a known device, method, or product ready for improvement to yield predictable results;
- (e) "Obvious to try" - choosing from a finite number of identified, predictable solutions, with a reasonable expectation of success;
- (f) Known work in one field of endeavor may prompt variations of it for use in either the same field or a different one based on design incentives or other market forces if the variations are predictable to one of ordinary skill in the art;
- (g) Some teaching, suggestion, or motivation to combine prior art references that would have led one of ordinary skill to modify the prior reference teachings to arrive at the claimed invention.

15. The Examiner notes that above rationales are merely exemplary. For more information, see MPEP § 2141.

16. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

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claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

17. Claims 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over FABER et al., US 5,489,639 (hereafter '639), as evidenced by *Sigma-Aldrich Product Description 344400: Copper(II) hydroxide phosphate* and *GE Plastics Product Description: VALOX® 325C*.

18. The basis of this rejection is adequately set forth in paragraphs 8-10 *supra*, and paragraphs 14-16 of the previous Office action mailed 30 November 2009, incorporated herein by reference.

19. Claims 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over WISSEMBORSKI et al., DE 19543803 A1 (hereafter '803), in view of FABER et al., US 5,489,639 (hereafter '639), as evidenced by *Sigma-Aldrich Product Description 344400: Copper(II) hydroxide phosphate* and *GE Plastics Product Description: VALOX® 325C*.

20. '803 discloses a method of making copper(II) hydroxide phosphate. The method comprises the steps of dispersing copper(II) hydroxide in water, adding phosphoric acid, and then heating the aqueous reaction medium to precipitate copper(II) hydroxide phosphate. The reaction mixture is then cooled and filtered to yield the precipitate and then dried. The product is incorporated into plastic materials.

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21. Regarding claim 25, '803 does specify the type of plastic, i.e. polymeric, material envisioned, though it references plethora of additional documents relevant to the incorporation of copper(II) hydroxide phosphate as a pigment for laser marking.

22. '639 discloses the use of copper(II) hydroxide phosphate (see *Sigma-Aldrich Product Description 344400: Copper(II) hydroxide phosphate*) as a pigment for laser marking (Abstract). The plastic materials disclosed therein include thermoplastic materials (col. 2, ln. 25-42) such as polybutylene terephthalate (see *GE Plastics Product Description: VALOX® 325C*). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the instant invention to incorporate the copper(II) hydroxide phosphate synthesized via the method of '803 into thermoplastic polymeric materials to render them laser-markable.

23. Claims 29 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over FABER et al., US 5,489,639 (hereafter '639), as evidenced by *Sigma-Aldrich Product Description 344400: Copper(II) hydroxide phosphate* and *GE Plastics Product Description: VALOX® 325C*, in view of PENGILLY, US 4,408,004 (hereafter '004).

24. The discussion of '639 and the evidentiary references in paragraphs 9-11 *supra* is incorporated herein by reference. '639 does not disclose softening the prior art composition via IR radiation.

25. '004 was previous discussed in paragraphs 26-32 of the previous Office action mailed 3 March 2009, also incorporated herein by reference. Briefly, '004 disclose heating of parisons (i.e. polyester preforms) via infrared light-emitting ovens to soften them for blow molding (col. 3, ln. 22-36). Therefore, it would have been obvious to one of ordinary skill in the art to soften the '639 polyester compositions via IR radiation in order to mold them into laser-markable objects.

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26. Claims 31-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over FABER et al., US 5,489,639 (hereafter '639), as evidenced by *Sigma-Aldrich Product Description 344400: Copper(II) hydroxide phosphate* and *GE Plastics Product Description: VALOX® 325C*, in view of MARTENS et al. (Martens, W., Frost, R.L. *American Mineralogist*, vol. 88, p. 37-46, Jan 2003).

27. The discussion of '639 and the evidentiary references in paragraphs 9-11, 17 and 18 *supra* is incorporated herein by reference. In comparison to claims 16-24, claims 31-40 ostensibly exclude copper(II) hydroxide phosphate having chemical formula $\text{Cu}_2\text{PO}_4\text{OH}$ from the scope of the claimed invention. '639 does not disclose additional salts falling within the Markush group of claims 31, 34, and 35.

28. MARTENS et al. considers three basic copper phosphate minerals: cornetite ($\text{Cu}_3\text{PO}_4(\text{OH})_3$), libethenite ($\text{Cu}_2\text{PO}_4\text{OH}$), and pseudomalachite ($\text{Cu}_5(\text{PO}_4)_2(\text{OH})_4$). These minerals demonstrate similarities and/or trends in crystal structure - the prior art reference is focused on their IR spectra (Abstract; p. 37). Notably, though different, the compounds display similar IR spectra behavior due their phosphate and hydroxyl groups (p. 38-45). One of ordinary skill, considering the disclosure of MARTENS et al. would reasonably conclude that the set of basic copper phosphate minerals discussed therein to form a family of compounds having similar behavior in terms of absorbance and transmission/emission of electromagnetic energy. The basis of such a conclusion rests upon the similarities in peak structure of their IR spectra (see Figures).

29. Since libethenite is already used as an effective pigment for laser marking in thermoplastic resin compositions, as taught by '639, one of ordinary skill in the art at the time of the instant invention would reasonably expect cornetite and pseudomalachite to demonstrate similar effects on the basis of their similar IR spectra and/or crystallographic structure.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the instant

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invention to utilize the aforementioned basic copper phosphate minerals interchangeably as functional equivalent laser marking pigments in the '639 composition.

Response to Arguments

30. Applicant's arguments filed 25 November 2010 have been fully considered but they are not persuasive.

31. With respect to FABER et al., US 5,489,639 (hereafter '639), Applicant has amended claim 16 to define "high IR absorption" and argues that because the prior art reference does not teach this definition and/or feature, '639 cannot anticipate the claimed invention. This argument is not persuasive for the reasons set forth in paragraph 11 *supra*.

32. Applicant also argues that because PENGILLY, US 4,408,004 (hereafter '004), does not disclose what additives could replace carbon black as a polyester reheat additive, and because the prior art does not disclose the copper phosphates as reheat additives, that the claimed invention is not obvious over the prior art. However, Applicant has simply recognized another utility of a family of compounds already recognized as a laser marking pigments. One of ordinary skill in the art would already be motivated to utilize copper phosphate compounds as laser marking pigments. For at least the foregoing reasons, Applicant's arguments are not persuasive.

Conclusion

33. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY H. SHEH whose telephone number is (571) 270-7746. The examiner can normally be reached on Mondays through Thursdays, 9:30A-3:30P.

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34. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, VASUDEVAN S. JAGANNATHAN can be reached on (571) 272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

35. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/ANTHONY H SHEH/
Examiner, Art Unit 1796

/Vasu Jagannathan/
Supervisory Patent Examiner, Art Unit 1796